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15 OCTOBER 1986

# Europe Report

SCIENCE AND TECHNOLOGY

BRITE: BASIC RESEARCH IN INDUSTRIAL  
TECHNOLOGIES FOR EUROPE

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## EUROPE REPORT

### SCIENCE AND TECHNOLOGY

#### BRITE: BASIC RESEARCH IN INDUSTRIAL TECHNOLOGIES FOR EUROPE

Brussels PRESS RELEASE 'BRITE' in English 4 Feb 86 pp 1, 4, 6-40;  
19 Jun 86 pp 1-3; INFORMATION PACKAGE FOR THE SECOND CALL FOR  
PROPOSALS FOR THE EUROPEAN COMMUNITY PROGRAM BRITE in English 1986  
pp I-II, 1-6, 15-19, 25-34, 56-58

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## WESTERN EUROPE/FACTORY AUTOMATION

### BRITE: BASIC RESEARCH IN INDUSTRIAL TECHNOLOGIES FOR EUROPE

#### First Phase Projects

Brussels PRESS RELEASE 'BRITE' in English 4 Feb 86 pp 1, 4, 6-40

[Text] The BRITE Program [Basic Research in Industrial Technologies for Europe] was launched by the European Community early in 1985 and is inspired by the Community programme on information technology, ESPRIT. A preliminary survey of the industry has enabled a list to be made of priority themes in new technologies in traditional sectors.

These themes cover nine major technological fields: the problems of reliability, wear and deterioration of materials and systems; laser technology and powder metallurgy; joining techniques; new testing methods, including non-destructive testing and computer-aided testing; computer-aided design and manufacturing (CAD/CAM); polymers, composites and other new materials: because the problems it is currently facing present a good example of the way new technologies can be applied, the sector chosen to benefit primarily from this initiative is the clothing industry (cutting out, handling and assembly techniques, etc).

Initially, the BRITE programme is planned to run for four years. The Community financial contribution to each project is up to 50 percent of the cost of staff, equipment, materials, computer services, etc. The rest is paid by the firms involved in the project. The rules require each project to have at least two partners from different countries, at least one of which must be an industrial firm. In practice, the projects group together an average of four partners in three or four countries and at least two industrial firms are involved in most cases.

The conditions of access to the information and exploitation of the results are based on the principle that the industrial property rights resulting from the research work belong in the first instance to the contractor who has carried out the work. Preferential access to the information and patents directly obtained thanks to the contracts with the Community, is granted in decreasing order of priority, to other contractors on the project, other participants in the BRITE programme working in the same field, and other firms established in the Community.

The BRITE programme is now actually under way.

In January 1986 contracts covering the first seven of 95 projects selected were sent for signature by the partners involved and all the corresponding research work will shortly be in progress.

The first phase consisting of 95 projects selected from the 559 proposals received following a call for proposals represents a total of some 120 million ECU half of which is contributed by the Community.

The projects involve 432 organizations from all Member States, i.e. a little over four organizations per project on average. The organizations can be broken down into 60 percent industrial firms (including 24 percent small and medium-sized firms), 21 percent research institutes and 19 percent universities.

The programme involves nearly all the main industrial sectors, e.g. motor industry, aeronautics, chemicals, textiles, metalworking, etc.

A full list of the projects in the first phase of the BRITE program follows:

# AREA 1 - RELIABILITY, WEAR AND DETERIORATION

\*\*\*\*\*

P-1015-1 -85

TITLE : ENHANCEMENT OF WEAR PROPERTIES OF CEMENTED TUNGSTEN CARBIDE AND CERAMIC MATERIALS THROUGH ION IMPLANTATION.

AERE HARWELL	* UK
SANDVIK HARD MATERIALS LTD	* UK
TECVAC LIMITED	* UK
IST.PER LA RICERCA SCIENT.& TECNOLOGIC	* I
SOCIETA PNEUMATICI PIRELLI SPA	* I
ACCIAIERIE DI BOLZANO SPA	* I
CST CIRCUITI STAMPATI	* I
GKN BOUND BROOK ITALIA SPA	* I

\*\*\*\*\*

P-1026-1 -85

TITLE : "DEVELOPMENT OF HIGH RELIABILITY DYNAMIC SEALS"

BHRA FLUID ENGINEERING	* UK
MARTIN MERKEL GMBH & CO KG	* D
SKF-UK LTD	* UK
HOTCHKISS-BRANDT SOGEME	* F
HALLITE SEALS INTERNATIONAL LTD	* UK
UNIV POITIERS	* F
TH AACHEN	* D

\*\*\*\*\*

P-1045-1 -85

TITLE : BEHAVIOUR OF ECONOMIC MATERIALS IN CORROSIVE AND EROSION INDUSTRIAL ATMOSPHERES

CEA	* F
UNIREC	* F
CSM	* I
ARMINES	* F

\*\*\*\*\*

P-1053-1 -85

TITLE : LOW TEMPERATURE DEPOSITION OF WEAR AND CORROSION RESISTANT LAYERS BY VACUUM ASSISTED PROCESSES

PHILIPS CFT, EINDHOVEN	* NL
SIEMENS ZFA FT3, ERLANGEN	* D
DONNELLY MIRRORS, NAAS	* IRL

\*\*\*\*\*

P-1079-1 -85

TITLE : STUDY OF FRICTION LOSSES IN INTERNAL COMBUSTION ENGINES

PSA	* F
BL TECHNOLOGY LTD	* UK
FIAT	* I
RENAULT	* F
UNIV LEEDS	* UK
UNIV POITIERS	* F
ENS DES ARTS ET METIERS	* F

\*\*\*\*\*

P-1109-1 -85

TITLE : FATIGUE LIFE OF STRUCTURAL COMPONENTS UNDER COMPLEX SERVICE LOADING

FIAT	* I
BL TECHNOLOGY LTD	* UK
PSA	* F
RENAULT	* F
UNIV BRISTOL	* UK
UNIV SHEFFIELD	* UK
ECOLE POLYTECHNIQUE	* F
CSM	* I

\*\*\*\*\*

P-1145-1 -85

TITLE : PREDICTION OF FATIGUE CRACK INITIATION ON DEFECTS IN WELDS AND CAST COMPONENTS

FRAMATOME	* F
UNIREC	* F
FRAUNHOFER GESELLSCHAFT	* D

\*\*\*\*\*

P-1149-1 -85

TITLE : STUDY AND IMPROVEMENT OF SILICON AND ALUMINIUM-BASED  
ELECTROCOATING ON STEELS

LA TREMPE SUPERFICIELLE SA	* B
CTRE RECH.IND.BELGE DE LA CERAMIQUE	* B
ECOLE POLYTECHNIQUE D'ATHENES (E P A)	* GR
ENS DES MINES DE ST-ETIENNE	* F

\*\*\*\*\*

P-1162-1 -85

TITLE : DEVELOPMENT OF COMPOSITE MATERIALS FOR HIGH TEMPERATURE  
HEAT EXCHANGERS AND THERMIONIC GENERATORS

ANSALDO	* I
ENEA	* I
XYCARB BV	* NL
TH EINDHOVEN	* NL

\*\*\*\*\*

P-1203-1 -85

TITLE : BASIC TECHNOLOGICAL DEVELOPMENT OF ADVANCED MATERIALS  
PROCESSING TECHNIQUES USING VACUUM PLASMA SPRAYING (VPS)

AERE HARWELL	* UK
INTERATOM GMBH	* D
LUCAS RESEARCH CENTRE	* UK
THE DANISH CORROSION CENTRE	* DK
ADMIRALTY RESEARCH ESTABLISHMENT	* UK
FRAUNHOFER GESELLSCHAFT	* D
PLASMA-TECHNIK LTD	* UK
PECHINEY	* F

\*\*\*\*\*

P-1209-1 -85

TITLE : LIFETIME PREDICTION AND EXTRAPOLATION METHODOLOGIES FOR  
COMPUTER AIDED ASSESSMENT OF COMPONENT SERVICE BEHAVIOUR  
UNDER STRESS AT HIGH TEMPERATURE

MAN TECHNOLOGIE GmbH	* D
BABCOCK POWER LIMITED	* UK
COMMISSION OF THE EUROPEAN COMMUNITIES	*



\*\*\*\*\*  
P-1270-1 -85  
TITLE : RELIABILITY METHODS FOR DESIGN AND OPERATION OF OFFSHORE  
AND MARINE STRUCTURES

TNO	* NL
IMPERIAL COLLEGE OF SCIENCE & TECHNOL	* UK
UNIV AALBORG	* DK
REGISTRO ITALIANA NAVALE	* I
VERITAS BUREAU	* F
SNAMPROGETTI	* I
ATKINS R. & D.	* UK
CTICM	* F
ELF	* F
D'APPOLONIA	* I

\*\*\*\*\*

P-1290-1 -85  
TITLE : CONDITION ASSESMENT OF INDUSTRIAL PRESSURE PARTS OPERATING  
AT ELEVATED TEMPERATURES .

ERA TECHNOLOGY LTD	* UK
ENEL CRTN	* I
INTERATOM GMBH	* D

\*\*\*\*\*  
P-1357-1 -85  
TITLE : MODIFICATION OF SURFACE PROPERTIES OF MATERIALS BY ION  
BOMBARDMENT.

PHILIPS	* NL
PHILIPS	* D
UNIV ERLANGEN NUERNBERG	* D
FRITZ STEPPER	* D
UNIV AARHUS	* DK
THE JUTLAND TECHNOLOGICAL INSTITUTE	* DK

\*\*\*\*\*

P-1528-1 -85

TITLE : ELECTROCHEMICALLY BASED TECHNIQUES FOR ASSESSING AND  
PREVENTING CORROSION OF STEEL IN CONCRETE.

DYCKERHOFF & WIDMANN AG	* D
BAM	* D
KORROSIONSCENTRALEN ATV	* DK
RAYCHEM LTD	* UK

\*\*\*\*\*

P-1552-1 -85

TITLE : DETERIORATION PREVENTION IN REINFORCED CONCRETE STRUCTURES  
SUBJECT TO HOSTILE ENVIRONMENTS.

TAYLOR WOODROW CONSTRUCTION LTD	* UK
BRITISH RAIL	* UK
NAT. TECH. UNIV. ATHENS	* GR

\*\*\*\*\*

P-1555-1 -85

TITLE : SURFACE ENGINEERING OF TITANIUM COMPONENTS

WOLFSON INST.FOR SURFACE ENGINEERING	* UK
TU CLAUSTHAL	* D
COSWORTH ENGINEERING LTD.	* UK
ELECTRICITY COUNCIL RESEARCH CENTRE	* UK
HEREAUS WC GMBH	* D
IMI TITANIUM LTD.	* UK
KAMAX WERKE OSTERODE	* UK
KLOECKNER IONON GMBH	* D
PLUS 5 PARTNERS (D, UK)	*

\*\*\*\*\*

AREA 2 - LASER TECHNOLOGY

\*\*\*\*\*

P-1206-2 -85

TITLE : ADAPTIVE CONTROL OF LASER PROCESSING

CULHAM LABORATORY

TNO PLUS 22 PARTNERS (UK, FRG, NL)

\* UK

\* NL

\*\*\*\*\*

P-1339-2 -85

TITLE : LASER SHEET METAL WELDING

RTM

CETIM

IMPERIAL COLLEGE OF SCIENCE & TECHNOL

ALFA ROMEO

AERITALIA

ENEA

RENAULT

AEROSPATIALE S.N.I.

BRITISH LEYLAND TECHNOLOGY LTD

\* I

\* F

\* UK

\* I

\* I

\* I

\* F

\* F

\* UK

\*\*\*\*\*

P-1345-2 -85

TITLE : THREE DIMENSION LASER . METAL INSULATING COMPUTER AIDED  
PHOTOCHEMISTRY. "3D LASER M.I.C.A.P"

MPI BIOPHYSIKALISCHE CHEMIE

CILAS ALCATEL

\* D

\* F

\*\*\*\*\*

P-1346-2, -85

TITLE : CO<sub>2</sub> LASER SURFACE TREATMENT OF BULK CERAMICS AND CERAMIC  
COATINGS

LABORATOIRES DE MARCOUSSIS

CTRE RECH.IND.BELGE DE LA CERAMIQUE

UNIV DORTMUND

SOC.D'ETUDE DE MACHINES THERMIQUES

\* F

\* B

\* D

\* F

\*\*\*\*\*

P-1550-2 -85

TITLE : WELDING BY FEEDBACK CONTROLLED LASER SYSTEM

COMPAGNIE BELGE DES LASERS

\* B

BIAS

\* D

SCIAKY SA

\* F

CEA

\* F

\*\*\*\*\*

P-1084-3 -85

TITLE : ADHESIVE BONDING TECHNOLOGY FOR ENGINEERING APPLICATIONS

PERA

\* UK

CETIM

\* F

OXFORD POLYTECHNIC

\* UK

PLUS 8 PARTNERS (IRL, UK)

\*\*\*\*\*

P-1244-3 -85

TITLE : BASIC RESEARCH INTO FABRICATING SILICON HEAT SINK ASSEMB-  
LIES IN HIGH POWER SEMICONDUCTOR DEVICES

ANSALDO

\* I

MARCONI

\* UK

GEC-HIRST

\* UK

ICFAM (S.C.)

\* I

\*\*\*\*\*

P-1279-3 -85

TITLE : RELIABILITY OF INTERFACES IN NEWLY DESIGNED CERAMIC -  
CERAMIC AND METAL-CERAMIC SYSTEMS

ENIRICERCH SPA

\* I

CSM

\* I

FRAUNHOFER GESELLSCHAFT

\* D

AREA 3 - JOINING TECHNIQUES

\*\*\*\*\*

P-1543-3 -85

TITLE : FLEXIBLE LOW COST AUTOMATION OF ARC WELDING

ODENSE STEEL SHIPYARD	* DK
CARL CLOOS SCHWEISSTECHNIK GMBH	* D
THE DANISH WELDING INSTITUTE	* DK
BRITISH MARITIME TECHNOLOGY	* UK
TU AACHEN	* D
HEMPEL TECHNOLOGY	* DK

\*\*\*\*\*

AREA 4 - NEW TESTING METHODS, INCLUDING NON-DESTRUCTIVE TESTING  
ON-LINE TESTING AND COMPUTER-AIDED TESTING

\*\*\*\*\*

P-1129-4 -85

TITLE : HIGH TEMPERATURE MEASUREMENT OF STRAIN IN STEEL USING  
NOVEL THIN FILM GAUGES

ERA TECHNOLOGY LTD	* UK
ENEL CRTN	* I
CEGB	* UK

\*\*\*\*\*

P-1224-4 -85

TITLE : SENSOR TECHNOLOGIES FOR MACHINE CONTROL AND CONDITION  
MONITORING

GEC	* UK
SIEMENS AG	* D

\*\*\*\*\*

P-1300-4 -85

TITLE : ACOUSTIC EMISSION FOR PROCESS MONITORING DURING METAL CUTTING

ROBERT BOSCH GMBH  
FRAUNHOFER GESELLSCHAFT  
DANFOSS

\* D  
\* D  
\* DK

\*\*\*\*\*

P-1343-4 -85

TITLE : ON-LINE (NON DESTRUCTIVE) TESTING METHODS FOR DETECTION / MEASUREMENT OF NON-HOMOGENEOUS MATERIALS IN VISCOUS STREAMS

MONTEFIBRE SPA  
ANIC FIBRE  
SNIA FIBRE SPA  
CISE  
CILAS ALCATEL

\* I  
\* I  
\* I  
\* I  
\* F

\*\*\*\*\*

P-1353-4 -85

TITLE : TESTING OF STRUCTURAL INTEGRITY OF BUILDING STRUCTURES AND MEASUREMENT OF THE POSITION OF THE REINFORCEMENTS

TH DARMSTADT  
STRABAG BAU-AG  
LIEBIG INTERNATIONAL  
INST FUER ZERSTOERUNGSFREIE PRUEFVERF.  
Ingenieurbuero KOENIG und HEUNISCH  
PVW B.V.

\* D  
\* D  
\* IRL  
\* D  
\* D  
\* NL

\*\*\*\*\*

P-1358-4 -85

TITLE : DEVELOPMENT OF NON DESTRUCTIVE HIGH PRECISION TEST METHODS FOR ASPHERIC COMPONENTS AND TOOLS IN OPTICS

PHILIPS  
UNIV STUTTGART  
CERCO

\* NL  
\* D  
\* F

\*\*\*\*\*

P-1368-4 -85

TITLE : NOISE/VIBRATION IMAGING TECHNIQUES FOR GAS TURBINE  
INVESTIGATIONS

METRAVIB  
GEC  
TU ATHENS

\* F  
\* UK  
\* GR

\*\*\*\*\*

P-1378-4 -85

TITLE : SENSOR DEVELOPMENT FOR TOOL MONITORING IN METAL CUTTING

KRUPP WIDIA GMBH  
TH AACHEN  
FN HERSTAL SA

\* D  
\* D  
\* B

\*\*\*\*\*

P-1382-4 -85

TITLE : SYSTEM FOR AUTOMATIC MONITORING OF TURBO MACHINERY

PATI GMBH  
TNO  
INTERATOM GMBH

\* D  
\* NL  
\* D

\*\*\*\*\*

P-1504-4 -85

TITLE : DEVELOPMENT OF HIGH RESOLUTION X-RAY SYSTEM WITH LINE DE-  
TECTOR FOR AUTOMATIC QUALITY CONTROL WITH COMPUTER AIDED  
REAL TIME IMAGE PROCESSING

FRAUNHOFER GESELLSCHAFT  
HEIMANN GMBH  
ANDREX

\* D  
\* D  
\* DK

\*\*\*\*\*

P-1512-4 -85

TITLE : NON DESTRUCTIVE EVALUATION OF WOODEN TRANSMISSION POLES

TIMBER RESEARCH & DEVELOPMENT ASSOC	* UK
UNIV MUENCHEN	* D
DANMARKS TEKNISKE HØJSKOLE	* DK

\*\*\*\*\*

P-1545-4 -85

TITLE : THE DEVELOPMENT OF AN NMR MICROSCOPE FOR STRUCTURAL AND  
DYNAMIC STUDIES OF CHEMICAL AND BIOCHEMICAL PROCESSES

GEC	* UK
UNIV ANTWERPEN	* B
PLANT GENETIC SYSTEMS	* B

\*\*\*\*\*

#### AREA 5 - CAD/CAM MATHEMATICAL MODELLING

\*\*\*\*\*

P-1025-5 -85

TITLE : "A COMPUTER INTEGRATED PROCESS PLANNING AND NC-PROGRAMMING  
SYSTEM"

HELLENIC AEROSPACE INDUSTRY LTD	* GR
CRANFIELD INSTITUTE OF TECHNOLOGY	* UK
UNIV PATRAS	* GR
ARISTOTELIAN UNIV THESSALONIKI	* GR
SSG INDUSTRIAL SYSTEM LTD	* UK



\*\*\*\*\*

P-1027-5 -85

TITLE : DEVELOPMENT OF EXPERIMENTALLY TESTED 3-D COMPUTER CODES  
FOR FUNDAMENTAL DESIGN OF PROCESS EQUIPMENT INVOLVING NON-  
NEWTONIAN MULTI-PHASE TURBULENT FLUIDS.

ICI	*	UK
UNILEVER NV	*	NL
IMPERIAL COLLEGE OF SCIENCE & TECHNOL	*	UK

\*\*\*\*\*

P-1239-5 -85

TITLE : COMPUTER AIDED DESIGN AND OPTIMISATION OF HIGH VOLTAGE  
CIRCUIT BREAKER BREAKING CHAMBERS

	*	
UNIV LIEGE-LABOR. D'ELECTR. APPLIQUEE	*	B
MERLIN GERIN	*	F
MAGRINI	*	I

\*\*\*\*\*

P-1256-5 -85

TITLE : NUMERICAL SIMULATION OF INJECTION MOLDING AND PREDICTION  
OF THE SHRINKAGE TOWARDS AIDED DESIGN AND OPTIMISATION OF  
INDUSTRIAL AUTOMATION COMPONENTS

LA TELEMECANIQUE ELECTRIQUE	*	F
UNIV CATH DE LOUVAIN	*	B
UNIV WALES	*	UK

\*\*\*\*\*

P-1313-5 -85

TITLE : BASIC RESEARCH INTO IMPROVED MANAGERIAL OPERATIONAL  
CONTROL AND PERFORMANCE FEEDBACK SYSTEMS FOR PROCESS PLANT

STEWART HUGHES LTD	*	UK
METRAVIB	*	F
GRS	*	D

\*\*\*\*\*

P-1320-5 -85

TITLE : CAD/CAM AND GROUP TECHNOLOGY FOR THE FURNITURE INDUSTRY

TECHNOLOGICAL INSTITUTE	* DK
SCANDIA RANDERS	* DK
HTH KOKKENER A/S	* DK
DENKA MOBLER A/S	* DK
TNO	* NL
FURNITURE INDUSTRY RESEARCH ASSOC	* UK

\*\*\*\*\*

P-1342-5 -85

TITLE : INTRODUCTION OF INSTABILITY AND PLASTICITY PHENOMENA INTO  
A COMPUTER AIDED DESIGN PROJECT FOR METALLIC STRUCTURES

UNIV LIEGE	* B
BUREAU D ETUDES GREISCH	* B
ARBED RECHERCHES	* L
ATELIERS DE BRAINE LE COMTE ET THIRIAU	* B

\*\*\*\*\*

P-1381-5 -85

TITLE : INTERACTIVE KNOWLEDGE BASED SHOP FLOOR CONTROL SYSTEM IN A  
SMALL MANUFACTURING ENTERPRISE ENVIRONMENT

FRAUNHOFER GESELLSCHAFT	* D
NIXDORF COMPUTER	* D
TAIGHDECLAR GENESIS TEORANTA	* IRL
UNIV COLLEGE GALWAY	* IRL

\*\*\*\*\*

P-1389-5 -85

TITLE : DEVELOPMENT AND APPLICATION OF MODULAR AND FLEXIBLE SYSTEMS FOR COMPUTER AIDED MANAGEMENT OF DISCONTINUOUS PRODUCTION PROCESSES IN SME

INSTITUT F. TEXTIL- U. VERFAHRENSTECH.	* D
INSTITUT TEXTILE DE FRANCE	* F
ETABLISSEMENT M. CAULLIEZ DELAOUTRE	* F
PHILDAR - LES FILS DE LOUIS MULLIEZ	* F
TEXUNION DIVISION IMPRESSION	* F

\*\*\*\*\*

P-1391-5 -85

TITLE : MOULD DESIGN AND MANUFACTURING OPTIMISATION BY DEVELOPMENT, STANDARDISATION AND INTEGRATION OF CAD/CAM PROCEDURES

CRIF/WTCM	* B
CADCO NV	* B
BELL TELEPHONE MFG CO	* B
PICANOL NV	* B
CIG INDUSTRY SYSTEMS & SERVICES	* B
TECNO DESIGN LTD	* IRL
BIBA	* D
KLOECKNER FERROMATIC-DESMAG GMBH	* D
DEWEK	* D
DEGUSSA AG	* D

\*\*\*\*\*

P-1397-5 -85

TITLE : MATHEMATICAL MODELLING OF 3D FLUID FLOW AROUND BLUFF BODIES

RENAULT	* F
CONCENTRATION HEAT & MOMENTUM LTD	* UK
ELECTRICITE DE FRANCE	* F
CONSERVATOIRE NAT. DES ARTS ET METIERS	* F
BL TECHNOLOGY LTD	* UK
FIAT	* I
PSA	* F

\*\*\*\*\*

P-1402-5 -85

TITLE : INTEGRATED FAILURE DETECTION DIAGNOSIS AND DECISION SYSTEM FOR INDUSTRIAL APPLICATIONS (IDDD)

SOC. VINCEY BOURGET	* F
LABOR.D AUTOMAT.RECHERCHE APPLIQ.NANCY	* F
COMSYS SA	* B
UNIVERSITE LIBRE DE BRUXELLES	* B

\*\*\*\*\*

P-1529-5 -85

TITLE : FULL NAVIER-STOKES EQUATIONS APPLIED TO TURBOMACHINERY  
PROBLEMS.

GEC  
TU ATHENS  
BERTIN & CIE

\* UK  
\* GR  
\* F

\*\*\*\*\*

AREA 6 - POLYMERS, COMPOSITES, OTHER NEW MATERIALS AND POWDER METALLURGY

\*\*\*\*\*

P-1044-6 -85

TITLE : NEW BIOCOMPATIBLE POLYMERS BASED ON CELL MEMBRANE MIMETICS

BIOCOMPATIBLES LTD  
CNRS  
UNIV LONDON

\* UK  
\* F  
\* UK

\*\*\*\*\*

P-1164-6 -85

TITLE : HIGH PURITY SINTER ACTIVE POWDERS AND DENSE SILICON  
NITRIDE CERAMICS

BRITISH CERAMIC RESEARCH ASS. LIMITED \* UK  
DYNAMIT NOBEL \* D  
TURNER & NEWALL MATERIALS RESEARCH LTD \* UK

\*\*\*\*\*  
P-1204-6 -85  
TITLE : CONTROL OF FIBRE MATRIX INTERACTIONS IN SIC/TI METAL MA-  
TRIX COMPOSITES

AERE HARWELL	* UK
ONERA	* F
SIGMA VERBUNDWERKSTOFFE	* D
DFVLR	* D
PLUS 14 PARTNERS (F, NL, UK)	*

\*\*\*\*\*  
P-1229-6 -85  
TITLE : DEVELOPMENT OF CONTINUOUS CARBON FIBRE REINFORCED THERMO-  
PLASTICS AND THEIR PROCESSING FOR COMPOSITE COMPONENTS

DORNIER GMBH	* D
BROCHIER SA	* F
DFVLR	* D
HELLENIC AEROSPACE INDUSTRY LTD	* GR

\*\*\*\*\*  
P-1246-6 -85  
TITLE : COMPOSITE STRUCTURAL COMPONENTS FOR WEAR- AND IMPACT-RE-  
SISTANCE IN STRESSED DYNAMIC PLANT APPLICATIONS

MORGAN MATERIALS TECHNOLOGY LTD	* UK
ESK GMBH	* D
IMPERIAL COLLEGE OF SCIENCE & TECHNOL	* UK

\*\*\*\*\*  
P-1253-6 -85  
TITLE : METAL REINFORCED CERAMICS

KRUPP WIDIA GMBH	* D
JOHNSON MATTHEY TECHNOLOGY CENTRE	* UK

\*\*\*\*\*

P-1263-6 -85

TITLE : FUNDAMENTAL STUDY OF MATERIALS AND PROCESSING TECHNOLOGIES  
FOR IMPROVED EMI SHIELDING COMPOSITES.

JOHNSON MATTHEY TECHNOLOGY CENTER	* UK
DSM	* NL

\*\*\*\*\*

P-1276-6 -85

TITLE : CHARACTERIZATION AND CORROSION BEHAVIOUR OF METALLIC  
POWDERS COMPACTED UNDER VARIOUS HIP CONDITIONS

ENEA	* I
CSM	* I
CISE	* I
UNIV ERLANGEN NUERNBERG	* D
SEILSTORFER GMBH	* D

\*\*\*\*\*

P-1286-6 -85

TITLE : 1) IMPROVEMENT OF THE LIFETIME OF WOVEN AND NON-WOVEN SYN-  
THETIC MATERIALS FOR GEOTEXTILES, PACKAGING AND AGRICULTU-  
RE. 2) APPLICATIONS IN CIVIL ENGINEERING

UCO SA	* B
CEBTP	* F
CRR	* B
TNO	* NL
SOC.COISNE ET LAMBERT	* F
MONTEFLUOS	* I

\*\*\*\*\*

P-1289-6 -85

TITLE : DEVELOPMENT OF HIGH TEMPERATURE POLYIMIDE COMPOSITE  
SYSTEMS

BP INTERNATIONAL LIMITED	* UK
ERA TECHNOLOGY LIMITED	* UK
MOTOREN-UND TURBINEN-UNION GmbH	* D
DORNIER GmbH	* D

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P-1299-6 -85

TITLE : THERMOSTABLE PHENOLIC COMPOSITE MATERIALS COMBINING MECHANICAL AND FIRE-SMOKE-TOXICITY HIGH PERFORMANCES

CDF CHIMIE SA	* F
UNIV LILLE	* F
UNIV NAMUR	* B
DFVLR	* D
BRUGGEMANN & BRAND	* D
BRITISH RAIL ENGINEERING	* UK

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P-1348-6 -85

TITLE : RELIABILITY.THERMOMECHANICAL AND FATIGUE BEHAVIOUR OF HIGH TEMPERATURE STRUCTURAL FIBROUS CERAMIC COMPOSITES

SEP	* F
MAN	* D
ISMRA	* F
INSA LYON	* F
UNIV STUTTGART	* D
MANCHESTER UNIVERSITY - SIMON LABORAT.	* UK
UMIST	* UK

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P-1350-6 -85

TITLE : DEVELOPMENT OF POWDER METALLURGY PROCESSING ROUTES FOR THE PRODUCTION OF MAIN LINE BEARINGS FOR AERO-GAS TURBINE ENGINES

ARMINES	* F
UNIV BRADFORD	* UK
RHP BEARINGS LTD	* UK
IMPHY SA	* F
SOCIETE NOUVELLE DE ROULEMENTS	* F
SINTERMETALLWERK KREBSOEGE GMBH	* D

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P-1356-6 -85

TITLE : ORIENTED POLYMERS OBTAINED BY RADIATION POLYMERIZATION OF  
ORIENTED LOW MOLECULAR WEIGHT SPECIES

PHILIPS	* NL
UNIV GRONINGEN	* NL
UCB	* B

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P-1369-6 -85

TITLE : AUTOMATIC LAYING OF UNIDIRECTIONAL C.F.C ON DOUBLE CON-  
TOURED SURFACES

AERITALIA	* I
JOBS SPA	* I
BRITISH AEROSPACE	* UK
CIBA GEIGY	* UK

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P-1388-6 -85

TITLE : OPTIMISATION OF FLEXIBLE INDUSTRIAL AND AGRICULTURAL PRO-  
DUCTS BASED ON FIBRES AND SYNTHETIC MATERIALS

SHIRLEY INSTITUTE	* UK
DEUTSCHES WOLLFORSCHUNGSINSTIT. AACHEN	* D
INSTITUT TEXTILE DE FRANCE	* F
INSTITUT FUER TEXTILTECHNIK	* D
CENTEXBEL	* B

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P-1438-6 -85

TITLE : FABRICATION AND ASSESSMENT TECHNIQUES FOR AMORPHOUS METAL  
COMPONENTS

VACUUMSCHMELZE GMBH	* D
GEC	* UK
AEG	* D



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P-1458-6 -85  
TITLE : ADVANCED TECHNOLOGY FOR THE MELT SPINNING OF CONTINUOUS  
SYNTHETIC FILAMENT YARN TO IMPROVE THE COMPETITIVENESS OF  
THE EUROPEAN TEXTILE INDUSTRY

ICI	* UK
ENKA AG	* D
RHONE POULENC S.A.	* F
BARMAG, BARMER MASCHINENFABRIK AG	* D

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P-1484-6 -85  
TITLE : DEVELOPMENT OF SECONDARY POLYMER CELLS FOR CONSUMER  
APPLICATION

VARTA BATTERIE AG	* D
NAT INST FOR HIGHER EDUCATION	* IRL
BASF AKTIENGESSELLSCHAFT	* D
CEA	* F

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P-1522-6 -85  
TITLE : ACCELERATED LASER AGEING OF PLASTICS

STANDARD ELEKTRIK LORENZ AG	* D
STANDARD TELECOMMUNICATION LABO. LTD.	* UK
DAIMLER-BENZ AG	* D
BL TECHNOLOGY LTD	* UK
VOLKSWAGENWERK AG	* D
FIAT	* I
RENAULT	* F
PEUGEOT	* F

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P-1523-6 -85  
TITLE : FIBRE REINFORCED PLASTIC COMPOSITE ENGINE

FORD-WERKE AG.	* D
GKN TECHNOLOGY	* UK
DSM	* NL
NATIONAL ENGINEERING LABORATORY	* UK
UNIV NOTTINGHAM	* UK
PILKINGTON BROS PLC	* UK
FORD MOTOR Co	* UK
GALVANOFORM	* D

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AREA 7 - MEMBRANE SCIENCE AND TECHNOLOGY  
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P-1096-7 -85

TITLE : DEVELOPMENT OF GASEOUS PERMEATION MEMBRANES ADAPTED FOR  
THE PURIFICATION OF HYDROCARBONS

GERTH	* F
GASUNIE	* NL
CEA	* F
IRCHA	* F

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P-1170-7 -85

TITLE : APPLICATION OF MEMBRANE PROCESSES TO THE TEXTILE INDUSTRY.  
DEVELOPMENT OF SPECIFIC MEMBRANES AND PROCESSES.

DE MARTINI SPA	* I
PEIGNAGE AUCHEL	* F
IST.TECNOTEX BIELLA CITTA'DEGLI STUDI	* I
FRAUNHOFER GESELLSCHAFT	* D
UNIV CALABRIA	* I

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P-1467-7 -85

TITLE : MEMBRANE SEPARATION OF CO2 AND H2S FROM MIXTURES WITH  
GASEOUS HYDROCARBONS

AKZO INTERNATIONAL RESEARCH BV.	* NL
ELF AQUITAINE	* F
TH TWENTE	* NL

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AREA 8 - CATALYSIS AND PARTICLE TECHNOLOGY

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P-1119-8 -85

TITLE : DEALUMINATION OF ZEOLITE TYPE MATERIALS TO DEVELOP  
CATALYSTS WITH IMPROVED SELECTIVITY

HALDOR TOPSOE A/S

\* DK

FACULTES UNIV NOTRE DAME DE LA PAIX

\* B

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P-1175-8 -85

TITLE : HOMOGENEOUS CATALYSIS INVOLVING TRANSITION METAL-PHOSPHI-  
NES OF REDUCED OXYDIZABILITY COMPLEXES AND OXYGEN

SNPE

\* F

AIR LIQUIDE

\* F

TNO

\* NL

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P-1202-8 -85

TITLE : BULK PRODUCTION OF PARTICLES BY ATOMIZATION: STUDY OF DROP  
INTERACTIONS, SIZE DISTRIBUTIONS AND SPRAY STRUCTURES WITH  
LASER TECHN.: COMPARISONS WITH PREDICTIONS OF MATH. MODELS

AERE HARWELL

\* UK

LECHLER GMBH

\* D

MUTEK

\* D

UNIV BREMEN

\* D

NIRO ATOMIZER A/S

\* DK

MALVERN INSTRUMENTS LTD

\* UK

ICI

\* UK

UNILEVER CENTRAL RESOURCES UK LTD

\* UK

STORK FRIESLAND

\* NL

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P-1428-8 -85

TITLE : SIMULTANEOUS REMOVAL OF NO<sub>x</sub> AND SO<sub>2</sub> THROUGH MOBILE BED  
CATALYTIC PROCESSES

ANIC FIBRE	* I
SNAMPROGETTI SPA	* I
AGIP	* I
UNIV BOLOGNA	* I
UNIV CATHOLIQUE DE LOUVAIN	* B
NAT INST FOR HIGHER EDUCATION	* IRL

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P-1495-8 -85

TITLE : NEW HOMOGENEOUS CATALYSTS FOR OXIDATION REACTIONS WITH  
HYDROGEN PEROXIDE OR MOLECULAR OXYGEN AS OXIDANTS.

DEGUSSA AG	* D
TH DARMSTADT	* D
UNIV UTRECHT	* NL
UNIV VENEZIA	* I

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P-1540-8 -85

TITLE : THE PREPARATION AND OPTIMISATION OF CATALYTIC MATERIALS  
FOR NO<sub>x</sub> REDUCTION IN ROTATIVE AIR-PREHEATERS.

JAMES HOWDEN HOLIMA BV	* NL
TU TWENTE	* NL
UNIV PATRAS	* GR
PUBLIC POWER CORPORATION	* GR

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P-1560-8 -85

TITLE : CONTROL OF SUSPENSION POLYMERIZATION REACTIONS FOR PRO-  
DUCTION OF POROUS MICROPARTICLES OF DESIRABLE PROPERTIES.

ARISTOLE UNIVERSITY OF THESSALONIKI	* GR
UNIV THESSALONIKI	* GR
EKO CHEMICALS A E	* GR
UNIV BRADFORD	* UK

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AREA 9 - NEW PRODUCTION TECHNOLOGIES SUITABLE FOR PRODUCTS MADE  
FROM FLEXIBLE MATERIALS

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P-1033-9 -85

TITLE : FOLDING DEVICES AND SENSORS TO AUTOMATE SEWING MACHINES  
FOR MIXED PRODUCTION

INST FUER BEKLEIDUNGSMASCHINEN E V	* D
INST FUER TEXTILE MESSTECHNIK	* D
MECH SYST INDUSTRIENAEHAUTOMATEN GMBH	* D
JENSEN & JULIEN S A	* B
TNO	* NL
ARBEITSGEMEINSCHAFT BEKLEIDUNGSINDUST.	* D

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P-1078-9 -85

TITLE : HIGHLY FLEXIBLE PROGRAMMABLE MODULAR SEWING CENTRE CAPABLE  
OF PERFORMING THE FULL RANGE OF OPERATIONS FORESEEN TO  
PRODUCE AN ARTICLE OF CLOTHING

ROCKWELL RIMOLDI SPA	* I
CETIH	* F
UNIV DURHAM	* UK

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P-1080-9 -85

TITLE : RESEARCH FOR AUTOMATIC SEWING AND IRONING UNIT WITH HEADS  
COUPLED TO SIMULTANEOUSLY WORK THE TWO OPPOSITE SIDES OF  
AN ARTICLE OF CLOTHING

ROCKWELL RIMOLDI SPA	* I
FIVES CAIL BABCOCK	* F
CETIH	* F

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P-1216-9 -85

TITLE : DEVELOPING A REAL TIME INTEGRATED OPERATOR COMMUNICATION  
SYSTEM AFFORDABLE BY CLOTHING SMES

ARTS LTD	* IRL
XETAL SYSTEMS LTD	* UK
TNO	* NL
IIRS	* IRL
APPAREL INDUSTRIES FEDERATION	* IRL

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P-1221-9 -85

TITLE : COMPUTER AIDED DESIGN OF CLOTHING

TNO	* NL
RNKT	* NL
AWFI-BEKLIDUNGSTECHNIK	* D
IIRS	* IRL
APPAREL INDUSTRIES FEDERATION	* IRL

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P-1230-9 -85

TITLE : A CONTINUOUS CUTTING SYSTEM WITH AUTOMATIC INSPECTION AND  
DYNAMIC PATTERN LAYOUT AS APPLIED TO THE GARMENT INDUSTRY

KRUPP DATENVERARBEITUNG	* D
UNIV LILLE	* F
DESIGN TECHNOLOGIES LIMITED	* UK

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P-1247-9 -85

TITLE : A FLEXIBLE MANUFACTURING SYSTEM FOR AUTOMATED ASSEMBLY OF  
APPAREL FROM FLEXIBLE MATERIALS

COURTAULDS CLOTHING LIMITED	* UK
PFAFF INDUSTRIEMASCHINEN GMBH	* D
GEC ELECTRICAL PROJECTS LIMITED	* UK
COURTAULDS RESEARCH	* UK

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P-1306-9 -85

TITLE : FIT-OPTIMIZED PATTERN DESIGN ON THE INTERACTIVE GRAPHICS  
SCREEN (2-D CONSTRUCTION)

EUROLOG SERVICE GMBH	* D
CIG INDUSTRY SYSTEMS SERVICES	* B
FORSCHUNGSINSTITUT HOHENSTEIN	* D
BRANDTEX A/S	* DK
WERNER CHRIST	* D
MAX SCHROEDER & Co.	* D

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P-1308-9 -85

TITLE : 2D AND 3D GARMENT MODELLING

CIG INDUSTRY SYSTEMS & SERVICES	* B
EUROLOG SERVICE	* D
CCCT	* B
LEE COOPER	* F

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P-1362-9 -85

TITLE : AUTOMATION OF THE PROCESSING AND CUTTING OF PATTERNED  
MATERIALS

LECTRA SYSTEMES	* F
GRUPPO FINANZIARIO TESSILE	* I
ENEA	* I
INCO SPA	* I

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P-1364-9 -85

TITLE : PLANNING, DEVELOPMENT AND DEMONSTRATION OF A PILOT FLEXI-  
BLE CELL FOR DIVERSIFIED MANUFACTURING OF CLOTHING

CETIH	* F
PFAFF INDUSTRIEMASCHINEN GMBH	* D
SANDT AG	* D
SCALABRE	* F
JAUNET JACQUES SA	* F
ABSORBA PORON	* F

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P-1478-9 -85

TITLE : PLANNING AND DEVELOPMENT OF AN INFORMATION AND COMMUNICATION SYSTEM FOR COMPUTER INTEGRATED MANUFACTURING IN THE APPAREL INDUSTRY

NIXDORF COMPUTER	* D
ANDREAS WEBER MODEN GMBH CO	* D
GIL BRET GMBH U CO.KG	* D
VERA MONT	* D
AWFI ARBEITSWISSENSCHAFTLICHES GMBH	* D
TNO	* NL

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P-1535-9 -85

TITLE : DEVELOPMENT OF A STANDARDISED MATERIAL TRANSPORT DEVICES FOR THE SEQUENTIAL AUTOMATION OF THE PROCESSING OF FLEXIBLE MATERIALS

PFAFF INDUSTRIEMASCHINEN GMBH	* D
BRANDEX A/S	* DK

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#### Eight More Projects Selected

Brussels PRESS RELEASE 'BRITE' in English 19 Jun 86 pp 1-3

[Text]

The BRITE Programme (Basic Research in Industrial Technologies for Europe) has recently expanded its portfolio from 95 projects to 103. The extra funds required have come from savings made during pre-contract negotiations on the projects selected for support last year (see IP(86)50).

The eight additional projects were selected from the reserve list of submissions which were highly rated during last year's evaluation, but for which not enough funding could be found. As such, they have all been through exactly the same scrutinizing process as the earlier batch of proposals. The topics range from surface fatigue crack prediction through laser technology, dyeing processes, membrane engineering, catalytic isomerization by new zeolites, and numerically-controlled sewing machines. The full list of these new projects to be supported under BRITE is attached.

This coincides with the publication in the Official Journal of the EC (O.J. No C 153, 19 June 1986) of an advance notice of the



second call for proposals for BRITE in order that those interested, in particular small and medium-sized enterprises, will have sufficient time to find partners and prepare proposals. The formal call is expected in late 1986 or early 1987 with a probable deadline on 31 March 1987.

Full details of the programme and how to apply are available in the Information Package for the second phase, available on request.

The Commission Services will help prospective applicants, particularly SMEs, to participate in the second phase of BRITE. Mindful in particular of the difficulty which companies may have in finding partners for BRITE projects, potential participants are encouraged to send in "expressions of interest" which should include a short description of the project in preparation. In this way prospective applicants can get advice in advance on whether their projects fall within the limits of the BRITE programme and the Commission will help to arrange partnerships based on the expressions of interest.

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P-1436-1-85

TITLE : Methods for predicting the effect of surface degradation of fatigue and fracture behaviour

AEG AKTIENGESSELLSCHAFT	D
GEC RESEARCH	UK
LABORATOIRES DE MARCOUSSIS	F
RISØ NATIONAL LABORATORY	DK
UNIV. DUBLIN	IRL

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P-1354-2-85

TITLE : High Power 15-20 kW CO2-lasers for materials processing

DFVLR	D
LABORATOIRES DE MARCOUSSIS	F

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P-1075-3-85

TITLE : The development of a flexible laser-robot system for the welding of formed sheet steel components under production line conditions

PSA	F
FERRANTI INDUSTRIAL ELECTRONICS	UK
THE WELDING INSTITUTE	UK

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**P-1287-4-85**  
**TITLE :** Computer control in continuous dyeing

UCO S.A.	B
CENTEXBEL	B
ICI	UK
MAHLO GMBH	D

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**P-1092-5-85**  
**TITLE :** Low cost CAD stations for generating tool trajectories of a cutting/welding laser robot

PRIMA INDUSTRIE	I
EUROSOFT	F
ERIA	SP

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**P-1566-7-85**  
**TITLE :** New membrane modules and fluid dynamics in membrane systems for liquid separation

A/S DE DANSKE SUKKERFABRIKKER	DK
SOC. LYONNAISE DES FAUX	F
IRCHA	F
IMPERIAL COLLEGE OF SCIENCE & TECHNOLOGY	UK
UNIV. COLLEGE WALES ABERYSWYTH	UK
DANMARKS TEKNISKE HØJSKOLE	DK

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**P-1098-8-85**  
**TITLE :** Preparation of new zeolite materials for the de-paraffining and isomerization of petroleum cuts

GERTH	F
ENS CHIMIE DE MONTPELLIER	F
UNIV. KARLSRUHE	D
UNIV. CATH. DE LOUVAIN	B

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**P-1089-9-85**  
**TITLE :** Loading and guiding systems for traditional and  
N-C sewing machines

NECCHI SPA	I
BERTIN & CIE	F
CREATI	F
PRIMA PROGETTI SPA	I
CARRERA SPA	I

### Second Call for Proposals

Brussels INFORMATION PACKAGE FOR THE SECOND CALL FOR PROPOSALS FOR THE  
EUROPEAN COMMUNITY PROGRAM BRITE in English 86 pp I-II, 1-6, 15-19, 25-34,  
56-58

[Official publication of the Commission of the European Communities, Brussels]

[Text] Summary

R&D carried out under BRITE must have a clear industrial potential and be  
pre-competitive : proposals involving R&D directed at short term  
development of new commercial products will not be eligible for support.  
The following rules normally apply :

#### Participation

- Projects should fall within the technical priority themes (Section V) as  
defined within the technical areas covered by BRITE : (Section VII) ;
- Participation is open to all industrial firms, research institutes and  
universities within the Community : (Section I - 3.1) ;
- Projects must involve partners from at least two Member States. At  
least, one of the partners must be an industrial firm. Preference will be  
given to projects involving two industrial partners from two different  
Member States : (Section I - 2.5) ;
- Research institutes and universities may only participate together with  
an industrial firm : (Section I - 2.6). Research institutes funded

entirely or mainly by industrial organisations may be considered as industrial firms : (Section I - 2.5) ;

- R&D must be carried out within the Community : (Section I - 2.5, 2.7, 3.1, 3.2) ;
- Projects selected for funding may receive up to 50% of the real cost of the project. The remaining costs must be borne by the industrial partners : (Section I - 4.2) ;
- Proposals must be of substantial size (i.e. costs between 1 and 2,5 MioECU) : (Section I - 2.8) ;
- Projects must be innovative and not duplicate other R&D work : (Section I - 3.3 / Section II - 2.1).

#### Submission of proposals

The main purpose of this information package is to inform potential applicants about the BRITE programme. The information package is published in advance of the official invitation to submit applications (known as the "call for proposals") in order to allow plenty of time for applicants to find partners and to prepare proposals. Those who are interested in applying to the programme must do so through the call for proposals. The next call for proposals for BRITE will be announced in the Official Journal of the European Communities at the end of 1986 or early in 1987 and will be sent to all on the BRITE mailing list.

- The most likely final date for the submission of proposals is 31 March 1987. Anyone who asks for the information package will be informed directly about the definite date : (Section II - 1, 1.4) ;
- Commission services and contact persons in the Member States can provide advice to proposers and assistance to help prospective applicants to find partners for BRITE projects. Prospective applicants are encouraged to send in "expressions of interest" : (Section I - 2.14, p. 9 & 10 ; 2.15, 9) ;
- Strict security measures are enforced to ensure confidentiality (Section I - 2.13, 5.4, 7, and Section III - 6) ;

- Projects will be evaluated by teams of independent experts. Applicants will normally receive within a maximum of 3 months a decision concerning their projects : (Section I - 5.2 and Section IV) ;
- For those projects selected for funding, contracts will be negotiated on the basis of a standard contract which also sets out the rules for the industrial property rights : (Section I - 6.5, Section III).

## SECTION I. BACKGROUND

### 1. Aims

The European Community launched its first four-year (1985-88) research and development (R&D) programme in the field of basic technological research in March 1985. This programme, known as BRITE (Basic Research in Industrial Technologies for Europe), is aimed at promoting technological research, which although not yet related to the development of marketable products or processes, pursues clear-cut industrial objectives. The main purpose of the programme is to bring together complementary research from different countries in the Community to work on projects which will improve the competitiveness of European industry. The programme is directed at traditional European industries, where there is a need to improve technology in order to enhance efficiency.

Industrial competitiveness within the European Community over the next decade will depend on the development of a number of technical areas, including those covered by the BRITE programme where they are divided into two main categories (1) as follows :

- I - R&D in new materials and new production technologies ;
- II - R&D (including pilot and demonstration projects) in new production technologies suitable for products made from flexible materials.

Within these areas, a list of priority themes has been identified following consultation with industry and appraisal of research priorities. The criteria used in the selection of the priority themes include technologies which encourage industrial productivity, product reliability, originality of design, and overall quality. The list of the priority themes, which is not exclusive, is provided in Section V.

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(1) : See Section VII

## 2. Criteria and Guidelines

- 2.1 The BRITE programme includes R&D projects supported financially by the Commission and carried out under contract, as well as co-operative R&D which is co-ordinated but not funded by the Commission through "concerted action" (see 2.12 below) on projects which may be supported by programmes in Member States.
- 2.2 Research and development carried out under the BRITE programme must be precompetitive. This means applied R&D which yields results which are of interest to industry. The R&D must therefore be beyond the stage of fundamental research, but be such that at the conclusion of the project it will still need further R&D to produce marketable products or processes.
- 2.3 Project proposals must fall within the technical areas set out in the Technical Annex of the Council Decision (Section VIII). All proposals relating to the areas set out in this annex will be considered. However, the priority themes (Section V) indicate the types of project which are considered particularly important. Proposals on other subjects are unlikely to succeed unless they clearly demonstrate very special merit.
- 2.4 The research must have clear industrial potential, and projects should be likely to have a substantial positive impact on industrial competitiveness in the Community in the medium- to long-term. **Proposals involving research directed at short-term development of new commercial products will NOT be eligible for support.**
- 2.5 A major objective of BRITE is to encourage cross-frontier co-operation within the Community in industrial R&D projects. For that reason all proposals must be submitted on behalf of a group of collaborating organisations. Each project must include a minimum of two eligible organisations from different Member States, at least one of which must be an industrial firm. There is a clear preference for projects which involve at least two independent industrial firms from at least two different Community countries.

For the purpose of this requirement, industrial research organisations and collective or co-operative research centres which are funded entirely or mainly by their members may be accepted as though they themselves are industrial firms. Projects involving such research organisations will have the best chance of success if named industrial partners, especially small or medium-sized enterprises, are included in the proposal either as active partners in the research work or as clients paying part of the cost. Where a substantial part of the financial support comes from government, then the organisation is treated as a research institution.

- 2.6 Universities and research institutes may only participate in the programme where they are in partnership with one or more industrial firms, or where they act as a subcontractor to industry.

- 2.7 Collaboration in projects must be much more than symbolic. Projects from two countries which show a substantial imbalance will not be acceptable. For example, a ratio of 2:1 in the contributions from the two countries is acceptable but a ratio of 10:1 is certainly not. Similarly, collaborating firms must be independent. Collaboration between a parent company and its subsidiary in another country will not be acceptable.
- 2.8 In order to achieve the objectives of the programme R&D projects supported by BRITE must necessarily be of substantial size. The average project is expected to entail costs of between 1 million ECU (2) (normal minimum) and 2.5 million ECU (usual maximum). Projects employing less than 3 or 4 full-time research workers for 3 or 4 years are unlikely to be selected for funding unless their potential is shown to be outstanding. In exceptional cases highly speculative R&D proposals could initially be for a feasibility study or for a first phase of the project.
- 2.9 Proposers must provide a work plan indicating the phases and targets for each stage of the project. This work plan must include the schedule of six monthly reports with other relevant targets. Projects of greater than two years duration must include a detailed statement of the technical targets expected to be reached at or about two years from commencement. Progress will be reviewed against those targets and decisions taken whether to continue, stop, or to make changes to the project.
- 2.10 The usual maximum duration for projects is 4 years. Exceptions to this will have to be negotiated with the Commission.
- 2.11 Mergers and restructuring of projects to achieve the best possible utilisation of resources may be necessary. The Commission may suggest such adjustments or other technical changes. All projects will be subject to a searching examination concerning the estimated costs.
- 2.12 The submission of concerted action projects is also encouraged, i.e. co-operative research projects in which participants pay the R&D costs with or without support from governments and the results of the work are shared amongst the participants. The Community does not support concerted action projects financially but may provide a secretariat and co-ordination facilities and make a contribution to the cost of meetings, workshops and seminars.
- 2.13 In all cases full confidentiality of information received is assured.
- 2.14 The Commission services will provide assistance to those who may be interested in submitting proposals. The "expressions of interest" form (see pages 9 and 10) may be used by those interested in submitting proposals and/or by companies looking for partners. Completed forms

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2 : ECU = European Currency Unit. Exchange rates for ECU are given daily in the Official Journal of the European Communities

should include a short description of the project in preparation, and should be sent to the Commission (or to the contact persons). In this way, prospective applicants can get advice in advance on whether their projects fall within the limits of the BRITE programme. This will avoid unnecessary effort being put into preparing a full proposal.

- 2.15 Advice is available in Member States from individuals who have been nominated for this purpose. A list of contact persons is given on pages 7 and 8. The Commission services recommend that all proposers seeking advice should do so at an early stage. An approach to the Commission or the appropriate contact person not later than the end of September 1986 is strongly advised.

### 3. Eligibility

- 3.1 The BRITE programme is open to all industrial enterprises (irrespective of size), research institutes, universities and other interested organisations within the European Community, provided that the work proposed is to be carried out in laboratories situated within the Community. It is possible for industrial firms to participate purely by the provision of funds. This may apply particularly in cases where research is to be carried out in universities or research institutes where 50% of the cost is paid by the Commission and the other 50% by the industrial partners. Participation of firms in non-Community EFTA (European Free Trade Association) countries is being discussed.
- 3.2 Proposers must indicate the location in Member States where the various parts of the R&D are to be carried out.
- 3.3 Projects must be innovative, and not duplicate other R&D work already taking place in the Community. If the idea is not completely new, then proposers must be able to show that their project is concerned with the new application of a known technique in a product or a process development.
- 3.4 The Commission will not consider projects where the first phase is a study of the literature to establish the state-of-the-art. Such work should be completed before a proposal is submitted and the current state-of-the-art clearly set out in the application.

### 4. Funding

- 4.1 The Council made 125 MioECU available for BRITE ; 65 MioECU has been committed for projects selected in the first phase. 60 MioECU is therefore available for the second phase of which approximately 20 MioECU will be allocated to projects following up feasibility studies or first parts of projects funded in the first phase. The remaining 40 MioECU is available for new projects and may be supplemented by a further sum, which will be indicated in the formal call for proposals.
- 4.2 As a general rule, the Community contribution will not exceed 50%, the remainder to be provided by the industrial partners.



- 4.3 In the case of universities or other educational establishments where staff costs and normal overheads are paid for from public funds, the Community contribution will normally be limited to 50% of the marginal cost (See Section III - 2.3). The remainder of the marginal costs must be provided by the industrial participants. In such cases it will often be convenient if the university is a sub-contractor.
- 4.4 Retrospective contracts will not normally be authorized. Exceptional cases can be considered but work carried out before signing the contract will be at the contractors' own risk.
- 4.5 Projects selected for funding will receive an advance payment shortly after contracts have been signed. Further payments will be made on submission of regular progress reports and invoices documenting expenditure. Details of payment procedures are given in Section III.

## 5. Selection and evaluation

- 5.1 Applications must conform with the guidelines set out in 1.2 above and meet the criteria used in the evaluation procedure (See Section IV). Proposals failing to satisfy these conditions will not be taken into account.
- 5.2 Evaluations of the technical aspects of proposals (Part II) will be carried out by a team of independent experts. On the basis of the evaluation, the Commission will make the final selection of projects, after the advice of the Management and Co-ordination Consultative Committee (CGC), composed of representatives of the Member State governments, has been received. The Commission will ensure protection of all information designated as confidential and ensure that the evaluation and selection process is carried out in a fair and equitable manner.
- 5.3 Selection will be made on the basis of the scientific and technical content of the proposals and on their relevance to the aims and objectives of the BRITE programme. When decisions have to be made between projects of similar technical merit and in respect of likely industrial impact, other factors will be taken into consideration. In such circumstances strong preference will be given to proposals which :
- involve small and medium-sized enterprises ;
  - seek to benefit industrial sectors judged to be in special need of new technology in order to improve their competitiveness on the world market.
- 5.4 The Commission will request the permission of proposers if there is a need to disclose certain information, for the purposes of establishing contracts and/or revising projects (see 2.11 above). The Commission undertakes not to disclose information about particular proposals to other contractors without the consent of the applicant. Proposers are nevertheless expected to be reasonable if the Commission requests the disclosure of non-confidential information.

5.5 The criteria used by the Commission in the evaluation process are set out in Section IV.

6. Preparation of contracts

6.1 Proposers who are selected for funding should be aware that it may take several months to negotiate and prepare contracts. In addition further information will be required. The following is an outline of preparatory steps involved in contract negotiation.

6.2 Successful applicants will receive a letter informing them that their project has been selected for funding.

6.3 The Commission may suggest various adjustments to proposed projects, for example, the combination of two small scale projects to make a new project (See 2.11). Where modifications are required, the proposers will be asked to submit a new project proposal.

6.4 Where the revised proposal has been agreed or if no modifications are required, the proposers will be asked to complete an administrative and financial form which includes the overall financial plan for the project, a breakdown of the estimated costs in detail and a well-defined research programme. Technical and administrative negotiations with the Commission may take place and following agreement on all aspects of the research project a formal written contract will be prepared by the Contracts Division for signature by the various participants.

6.5 The negotiations on all aspects of the projects may take some months depending on any difficulties or complexities encountered and successful proposers should, therefore, plan their work programme accordingly. The Commission will not accept any costs incurred before the formal commencement date specified in the contract.

7. Confidentiality

Any information given to the Commission relating to the expressions of interest, the application or the contracts will be treated in confidence. At all times, strict security measures are enforced to ensure confidentiality (see section III).

8. Management of the project

8.1 The Commission will negotiate contracts and supervise the projects.

8.2 The contract will specify the arrangements which the Commission may make to monitor the progress of the project. This may include visits to the work site(s) as well as regular meetings to discuss the work. Contractors must submit regular (six monthly) progress reports throughout the duration of the project.

- 8.3 In order to make communications easier, the Commission will appoint a project co-ordinator for each project. The contractors will also be required to nominate a project co-ordinator to liaise with the Commission.
- 8.4 Details of the financial management of the project must be made available to the Commission.

9. Further information

Those interested in the BRITE programme should direct their enquiries to the national contact persons listed on pages 7 and 8. Where further assistance is needed, prospective applicants may contact the staff in the BRITE programme at :

Commission of the European Communities  
Directorate-General for Science, Research and Development  
Division XII-C-1 BRITE (ArtsLux 3/52)  
Rue de la Loi 200  
B - 1049 Brussels  
Telex : 21877 COMEU B  
Telecopier : (02) 235.80.46

Section III. PRINCIPLES GOVERNING CONTRACTS

1. Format of contract

- 1.1 The contract to be concluded with successful proposers will be similar to the model contract. (Copies of the model contract are available on request) This model contract includes standard conditions relating to all BRITE projects. It also contains three standard annexes, the contents of which are outlined below.
- Annex I (of the model contract) contains general terms and conditions relating to the execution of the work, submission of reports, placing of sub-contracts, the use of external assistance and termination of the contract.
  - Annex II (of the model contract) contains rules on the dissemination of information and exploitation of results. It also includes conditions relating to agreements between partners, exchanges of information and granting of licences amongst partners as well as between partners and complementary contractors.
  - Annex III (of the model contract) specifies the categories of allowable costs to be charged to the Commission. It outlines details relating to

the submission of statements of expenditure and Commission's payment and auditing procedures.

The contract will also contain financial details and provisions relevant to the particular project. A technical annex describing the research programme, its objectives, and criteria relating to the two-year technical review will also be included.

- 1.2 The contract will be adapted to take account of specific conditions. For example, where a university or higher educational institution is a partner or major sub-contractor, only the marginal costs will be allowed (see 2.3 below).
- 1.3 Each contract will be prepared for signature in one language which is usually the language of the prime proposer of the project, unless the partners agree to use a different language. Similarly, the contract will be regulated by the law of the prime proposer, but in the event of no agreement on this amongst the partners, it will be subject to Belgian law. As far as possible partners will be given copies of the standard contract conditions and annexes in their own language for information purposes.
- 1.4 Each partner will be sent three copies of the contract for signature and the Commission will sign all the copies of the contract when each partner has signed its three copies. The Commission will certify that all the signed copies are identical.

## 2. Financial provisions

- 2.1 The Commission's financial contribution will normally be limited to a maximum of 50% of the actual cost of the project. The remaining balancing funds must normally be provided by the industrial participants. The Commission will make an advance payment (approximately 20% for a 2-year project and approximately 7.5% for a 4-year project) following the signature of the contract by all the partners and the Commission. Further payments will depend on submission of progress reports and invoices which must cover the same period as the reports (normally each 6 months from the commencement date specified in the contract). Statements of expenditure must be given in the currency in which the expense was incurred.

Periodic payments will be made on the basis of the percentage contribution of the Commission as specified in the contract. On completion of the project a confidential report must be submitted indicating if and how the contractor intends to exploit the results of the work. An amount equal to 5% of the Commission's contribution will be withheld from the final payment until all technical work specified in the contract has been completed to the satisfaction of the Commission and the final report and other documentation have been received and approved.

- 2.2 The Commission's contribution will cover only actual direct expenditure borne by the contractor and which is necessary for the execution of the specified work.

In the case of organisations other than universities, allowable costs include :

- labour to be charged at actual cost or known and approved rates ;
- travel and subsistence ;
- consumable materials ;
- equipment to be depreciated over 5 years ;
- computing ;
- external assistance (sub-contracts or services) ;
- overheads in accordance with known and approved policies and not exceeding those charged to government departments for research carried out on a similar basis.

Costs may not include :

- profit ;
- costs incurred in preparing and presenting the project proposal ;
- costs relating to the preparation and filing of applications for patent or other commercial or industrial property rights relating to project results.

- 2.3 The allowable costs for universities and institutes of higher education are restricted to the marginal costs. These are the actual additional direct costs of the research not met by normal recurrent expenditure, other financial sources (any grant, subsidy or other means of financial support) or other third parties. Marginal costs may include items listed in 2.2 above, except that :

- labour may consist only of temporary additional staff specifically engaged for the research and who are not permanently employed by the university. Such staff must be charged at actual cost.
- routine and minor computing costs may not be charged.
- overheads may be charged at a fixed percentage of up to 40% of certain items of expenditure. The percentage must accord with the normal policies of the university approved by the Commission and must not exceed the rate charged to government departments for research carried out on a similar basis. Overheads will not be allowable on equipment and external assistance.
- The Commission's financial contribution will normally be limited to a maximum of 50% of the marginal costs ; the remaining costs must normally be provided by the industrial partners.

- 2.4 The contract will be expressed in ECU and all payments will be made by the Commission in ECU. Any contractor which has an ECU account will receive the payments in ECU. For others the payments will be received in the national currency of the contractor concerned in accordance with internal banking regulations of the relevant Member State.

The exchange rate used by the Commission referred to in the model contract is the rate for the month immediately succeeding the statement of expenditure. For example, where a contract starts on 1 January, the statement of expenditure for the period January to June should be submitted in July and the exchange rate for August will be used.

All contractors must submit their statements of expenditure through the project co-ordinator. The Commission prefers to make a single payment to the contractor, but, if necessary, the contract will provide for each partner to be paid directly.

### 3. Responsibilities

- 3.1 Partners will assume full responsibility for carrying out their part of the project as specified in the technical annex to the contract. The model contract also states the responsibility of the partners to each other, and to the Commission.
- 3.2 Contractual arrangements will enable collaborating organisations to work together as partners or as sub-contractors, and subject to the provisions in Article 5 of Annex II of the model contract, the partners may conclude co-operation agreements amongst themselves.

### 4. Reporting

- 4.1 The contractor must submit regular (normally six monthly) progress reports and a final report to the Commission. The progress reports must describe the technical and research work carried out, the results obtained during the reporting period and a statement of the work envisaged during the subsequent period.

The final report must give a full description of the work and research carried out and the results obtained in the performance of the contract. It must include details of the industrial and intellectual property rights applied for and received, and all other information relevant to exploitation and follow-up work.

- 4.2 If requested by a contractor, the six-monthly and the final reports will be treated as confidential by the Commission. However, all such reports must append a non-confidential summary which can, if necessary, be published and widely circulated. These summary reports should therefore exclude confidential information and/or patentable information not yet legally protected. They should, however, provide an adequate description

of the work achieved and an explanation of how the project meets the overall objectives of the programme.

## 5. Ownership and exploitation of results

Annex II to the model contract sets out clearly the standard conditions applying to ownership and exploitation of projects.

The basic principles are :

- 5.1 Industrial property generated under the contract is owned by the contractors.
- 5.2 Collaborating contractors are responsible for reaching agreement among themselves about its disposition.
- 5.3 Ownership of industrial property not generated by the BRITE programme is not affected by EC contracts, although there are obligations, subject to agreed qualifications and restrictions, to grant licences to use such property rights in certain circumstances.
- 5.4 Collaborating contractors must provide licences to each other, normally royalty-free to the extent needed to ensure satisfactory co-operation during the R&D work and for subsequent exploitation.
- 5.5 Licences to use industrial property rights generated by the BRITE programme must be granted in certain circumstances and subject to agreed qualifications, restrictions and financial terms, to contractors participating in other Community R&D programmes.
- 5.6 A royalty-free licence to use the industrial property rights generated by the BRITE programme must be granted to the Community for its own needs (Joint Research Centre).
- 5.7 Exploitation of the results must commence within 3 years of the completion of the project or such other reasonable time agreed by the Commission or by either the contractors, or by others which they choose for the purpose or, at the request of contractors, by others chosen by the Commission. Reimbursement of the Commission's contribution will be required in the case that a contractor refuses to implement any of these options.
- 5.8 Prior commitments or major business interests will, however, normally be respected if they make such licensing arrangements unreasonable. Such interests must be declared in advance.

- 5.9 Although confidentiality of all commercially sensitive information is guaranteed, the contractors must allow results of the R&D to be disseminated by the Commission.

## 6. Confidentiality

The central point here is that the Commission and the contractors guarantee to maintain the confidentiality of everything which might be prejudicial to other parties involved. Furthermore the Commission will take all practical steps to ensure that confidentiality is maintained when any information is passed on to any authorized third parties.

(reference : Article 10 of Annex I and Article 2 of Annex II to the model contract)

## Section V. LIST OF PRIORITY THEMES

### 1. RELIABILITY, WEAR AND DETERIORATION

#### 1.1 Designing for reliability

1.1.1 Methodology development for structures, process plant and mechanical components ;

1.1.2 Probabilistic approach, employing the development of models of behaviour based on fracture mechanics analysis ;

1.1.3 Realistic models for life prediction, taking into account possible interactive effects of multiaxial stress and environmental conditions.

#### 1.2 Prediction and enhancement of residual life

1.2.1 Critical industrial systems ;

1.2.2 Innovation in methodology of prediction, methods of assessment and methods of monitoring ; particularly on-line monitoring ;

1.2.3 Improved reliability based approaches to life enhancement, including integrated maintenance strategies.



### 1.3 Effect of inhomogeneities on service behaviour

1.3.1 Effect of flaws on service behaviour, particularly of joints ;  
modelling crack behaviour ;

1.3.2 Modelling the service behaviour of coated and surface treated materials.

### 1.4 Wear and fretting

1.4.1 Multidisciplinary approaches for research and wear prevention through surface treatment and coating.

### 1.5 Tribology of mechanical systems

1.5.1 High temperature and or high speed problems, inorganic lubrication ;

1.5.2 Frictional surfaces (e.g. in clutches, brakes, and seals) new material development ;

1.5.3 Performance reliability and design of advanced tribological systems and components in engines, pumps and compressors.

### 1.6 Bearing systems and sliding contacts

1.6.1 Operation in dirty environments and contaminated process fluids ;

1.6.2 Dry bearings of advanced and composite materials ;

1.6.3 Problems of noise and vibration.

### 1.7 Gears and highly stressed tribocontacts

1.7.1 Design, and development of surface finish, lubricant and materials ;

1.7.2 Lower cost systems development ;

1.7.3 Rolling contacts in severe conditions (e.g. high temperature, lubricant starvation, lubrication by process fluid) ;

1.7.4 Tribological problems in shaping and forming of materials.

### 1.8 Corrosion and corrosion protection

1.8.1 Modelling of corrosion processes and its monitoring, including in-service monitoring and control ;

1.8.2 Improvement of intrinsic corrosion resistance of materials and systems ;

1.8.3 Coatings for special environments (e.g. oil and gas wells, geothermal wells, process plants, marine systems).

1.9 Wear resistance of tools and other components

1.9.1 New coating and surfacing treatments (e.g. ion-assisted coating) ;

1.9.2 New coating materials and multi-layer coatings ;

1.9.3 Wear mechanisms - related to improved tool performance ;

1.9.4 Improvement of dies operating in extreme conditions.

1.10 Surface engineering

1.10.1 Modification of surface properties by novel surface treatments ;

1.10.2 New coating and surfacing techniques, development of systems ;

1.10.3 Cladding technology fabrication/processing ;

1.10.4 Thermal barrier coatings ;

1.10.5 Repair technology for coatings ;

1.10.6 Surface technology for erosion and abrasion (high temperature and abrasive fluid) ;

1.10.7 Innovative electro-plating technology ;

1.10.8 Improved painting systems (pre-treatment and techniques) ;

1.10.9 Non destructive evaluation of treated surfaces (in particular for in-service monitoring).

1.11 Biodeterioration

Selection and development of materials for medical implants with adequate performance as to :

1.11.1 Friction behaviour ;

1.11.2 Corrosion resistance ;

1.11.3 Electromagnetic wave transmission ;

#### 1.11.4 Joining and fastening.

## 2. LASER TECHNOLOGY

### 2.1 R&D into laser sources with high beam quality for industrial applications

#### 2.1.1 High power continuous wave CO<sub>2</sub> gas lasers in the power range above 10 kw ;

#### 2.1.2 High power continuous wave CO gas lasers in the multikilowatt range ;

#### 2.1.3 Solid state lasers in the power range of 1 kw and above ;

#### 2.1.4 UV lasers (excimer lasers, etc.).

### 2.2 R&D into laser beam delivery systems and equipment

#### 2.2.1 Optical transmission systems (e.g. windows, fibre optics, mirrors, etc.) ;

#### 2.2.2 CNC and robotic delivery systems ;

#### 2.2.3 Integrated equipment (process feedback, automated systems, etc.).

### 2.3 R&D for industrial manufacturing applications

#### 2.3.1 Research on the interaction of laser beams with materials, with a view to greater control or efficiency of laser processing ;

#### 2.3.2 Research into the industrial applications of lasers, including those listed in 2.1 (e.g. welding, surface treatment, material processing, cutting applications of high novelty, industrial health and safety) ;

#### 2.3.3 Research into laser based diagnostic techniques for industrial application (e.g. surface analysis, pollution monitoring, on-line product quality control).

## 3. JOINING TECHNIQUES

### 3.1 Development of new welding processes

#### 3.1.1 Laser welding for light and heavy components ;

### 3.1.2 Electron beam welding for heavy sections.

## 3.2 Improvement of established welding techniques

3.2.1 Arc welding : process modelling, knowledge based systems, sensors (vision systems), off-line programming of welding robots, narrow gap welding ;

3.2.2 Resistance welding of new materials including coated steels, metal matrix composites ;

3.2.3 Electron beam welding : heat affected fragility problems and novel remedy methods.

## 3.3 Adhesive bonding for non aerospace applications

3.3.1 Improved technology of adhesive bonding to reduce cost, improve reliability and extend the application range of joints between metals, between metals and polymer-based materials, and between polymer-based materials ;

3.3.2 Environmental stability data on rapidly cured, or solidified adhesives ;

3.3.3 Novel reliability procedures for accelerated ageing especially in humid environments ;

3.3.4 Novel approaches to improve application techniques attaining speeds, precision and flexibility needed by mass production.

## 3.4 Development of micro-joining techniques.

## 3.5 Diffusion bonding to overcome design and material joining difficulties.

3.6 Development of brazing materials and techniques for improved performance joints, particularly in high temperature materials, e.g. oxide-dispersion - strengthened materials.

3.7 Bonding of ceramics to each other and to metals for engineering applications.

**4. NEW TESTING METHODS, INCLUDING NON-DESTRUCTIVE TESTING, ON-LINE TESTING AND COMPUTER-AIDED TESTING**

- 4.1 Development of innovative transducer technology for testing, non-destructive evaluation (NDE), measurement and control.
- 4.2 Optical, photo-thermal, photo-acoustic and other related testing techniques for surface and sub-surface inspection.
- 4.3 NDE techniques to monitor dynamic systems under service conditions.
- 4.4 Image processing techniques including applications in X-ray, ultrasonic and optical methods.
- 4.5 The analysis of the microstructure of materials and of stresses in them.
- 4.6 Development of improved methods for the inspection of external and internal surfaces and for near surface defect detection.
- 4.7 Novel methods for the NDE of reinforced and pre-stressed concrete, including integrity and degree of the deterioration of the steel reinforcement.
- 4.8 Innovative uses of optical techniques for monitoring positioning and process control.
- 4.9 Novel NDE methods specific to advanced materials, including polymers, composites, ceramics and semiconductor materials.

**5. CAD/CAM AND MATHEMATICAL MODELLING (advanced design and manufacturing techniques, in particular those suitable for SMEs and for specialised industrial purposes)**

- 5.1 Research (which can include work leading to automatic production planning and costing procedures as well as data preparation may be included where appropriate) on integrated computer-assisted systems, particularly those suitable for SMEs, for the design and manufacture of :
  - 5.1.1 Tools, dies and moulds (including simulation and CAD/CAM for injection moulding and reaction injection moulding) ;

5.1.2 Components made of sheet metal, including the generation of drawing tools, as well as unfolded sheet metals ;

5.1.3 Composite materials (especially fibre-reinforced composites), including materials, manufacturing machinery, tools, moulds, etc., and components.

5.2 Dedicated computer-assisted techniques, in particular those suitable for SMEs, in design and manufacture for specialised industrial purposes, e.g. ship design and shipbuilding, the design and manufacturing of products made of materials of varying characteristics such as wood or glass, and the design and manufacture of turbo-machinery.

5.3 Modelling of adhesive bonding and adaptive paint spraying.

5.4 Mathematical modelling for the design and optimisation of non-destructive evaluation procedures such as ultrasonic and eddy current testing particularly for on-line control configuration.

5.5 Mathematical modelling in a range of flow systems :

5.5.1 Casting, forging and moulding processes ;

5.5.2 Industrial processes, involving flows of gases and/or liquids and/or solids ;

5.5.3 Vehicle aerodynamics ;

5.5.4 Flow and combustion in internal combustion engines.

5.6 Advanced structural analysis including :

5.6.1 Uncertainty analysis and design of structures against fracture (failure) ;

5.6.2 Numerical analysis of sheet metal forming and elastic spring-back of sheet metal after forming ;

5.6.3 Modelling of stresses and strains in complex structures under service loads, in particular in composite materials.

## 6. POLYMERS, COMPOSITES, OTHER NEW MATERIALS AND POWDER TECHNOLOGY

6.1 Manufacturing technology of composites for structural applications

6.1.1 Reinforcing materials, fibres, particles and interfacial agents for ceramics, metals and polymers with good cost-performance relationship ;

- 6.1.2 Reinforced materials and the technology to manufacture components and structures from such material ;
- 6.1.3 Self-reinforced materials e.g. molecular components ;
- 6.1.4 New composites of improved behaviour for general industrial applications, particularly of improved tensile strength and ductility.
- 6.2 Manufacturing technology of copolymers, blends and polymer alloys for structural and engineering applications.
- 6.3 Specific functional applications of special polymers, e.g. semi and photoconductive polymers, conductive polymers, polymers for biological or biomedical applications, polymers for controlled release and oil recovery, polymers for information storage and transfer, multilayer materials.
- 6.4 Specific functional applications of ceramics and glasses e.g. components for use with electronic devices, optical and biomedical applications, etc.
- 6.5 Production, compaction and sintering of powders for the cost effective manufacturing of components.
- 6.6 Innovative approaches to process control for application in the relevant industries.
- 6.7 Study of mechanical and physical properties and applications for new products made of polymers.

## 7. MEMBRANE SCIENCE AND TECHNOLOGY

- 7.1 Innovative industrial applications for membranes for the separation of liquid mixtures and gas streams.
- 7.2 Integrated membrane processes for new methods of industrial production.
- 7.3 Bipolar membranes, facilitated transport and new membrane technology applications.

Priority will be given to proposals which involve the use of new membrane technologies, e.g. membrane distillation, pervaporation, bipolar membranes, facilitated transport.

- 7.4 Development of new membranes using mainly high temperature resistant, organic solvent resistant, inorganic materials (ceramics) and polymeric materials. Development of new membrane supports.
- 7.5 Membranes for novel electrochemical processes.
- 7.6 Functionalised membranes (excluding immobilized enzymes) to be used in industrial mass- and energy-transfer and conversion applications.

## 8. CATALYSIS AND PARTICLE TECHNOLOGY

- 8.1 The development of selective catalysts excluding those for conventional petrochemical application, including the development of methods for studying the fundamental problems involved as well as those for supports.
  - 8.1.1 Synthesis and characterization of novel zeolites and other materials of well defined structure focussed on fine chemistry ;
  - 8.1.2 Development of catalytic processes using homogeneous catalysis for non-radical oxidation but excluding epoxidation.
- 8.2 Completely new and highly innovative approaches to the catalytic purification of industrial effluents, including  $\text{SO}_2$  and  $\text{NO}_x$  disposal.
- 8.3 Novel approaches in the engineering of new particle materials. This includes :

The production of particles :

- 8.3.1 With controlled or special properties ;
- 8.3.2 Precipitation processes ;
- 8.3.3 The effects of impurities of particle and crystal growth processes ;
- 8.3.4 Control and production of drop sizes from sprays and nozzles ;



The particle interaction :

8.3.5 Agglomeration of colloidal suspensions to produce particulate matter ;

8.3.6 Adhesion of particles to surfaces ;

8.3.7 Multiphase systems ;

8.3.8 Removal of particulate solids from hot gases.

8.4 Design of equipment for processing of such particulate matter, especially relating to multiphase systems and hot gas cleaning, and the development of on-line instrumentation for the characterization of particles including sampling procedures.

## 9. NEW PRODUCTION TECHNOLOGIES SUITABLE FOR PRODUCTS MADE FROM FLEXIBLE MATERIALS

Apart from the specific themes listed below, proposals will also be considered for research which could lead to substantial cost reductions in existing systems, particularly with a view to making them accessible to small and medium-sized enterprises.

9.1 The automated handling of flexible materials and articles made from them. This may include research into :

9.1.1 Automatic loading and unloading of machines with workpieces using various delivery systems to permit sequential operations, or multiple machine control by one operator ;

9.1.2 Automatic delivery of workpieces to work stations whether cutting, joining, assembling, finishing or packing ;

9.1.3 Ancillary elements such as devices to grip flexible materials and sub-assemblies made from them, optical, electromagnetic and tactile sensors, techniques for marking, identifying and orientation of such materials, programmable devices and adaptive controls to ensure continuous optimum manufacturing efficiency ;

9.1.4 Automatic control of the work pieces on edge and line.

9.2 Automated joining of flexible materials and their assembly into finished products. This may include research into :

- 9.2.1 Automatic adaptive control of workpieces during joining and assembling, especially control devices capable of being used with different machines ;
- 9.2.2 Programmable, fixed or mobile sewing heads capable of carrying out a variety of operations ; multipurpose automatic machines or machines with interchangeable accessories ;
- 9.2.3 New joining technology, in particular new stitch technology, for example possible ways of lock-stitching from one side only and research into parameters affecting seam quality.
- 9.3 The integration of the above technologies together with others leading to flexible sequential automated manufacture, with particular emphasis on the need to accommodate multi-product manufacture and frequent model changes. This may include research into :
  - 9.3.1 Material characteristics in relation to automated manufacture, and the control and elimination of materials faults ;
  - 9.3.2 Computer-aided creation of designs, and preparation of two-dimensional patterns or marker making from three-dimensional screen images, with interactive nesting systems ;
  - 9.3.3 Alternative cutting methods such as high-speed single-ply cutting by multihead laser cutters, or by other techniques ;
  - 9.3.4 Alternative joining or shaping techniques such as fusing, pressing, welding or adhesives, and any other technique not using stitching ;
  - 9.3.5 Specialized knitting technology for example complete automatic production of finished articles with few or no joining or linking operations ; or detection and elimination of faults ;
  - 9.3.6 Complete automatic computer-aided flexible production systems suitable either for large scale repetitive operations, or for flexible production requiring frequent design changes. Sub-components or modules which could form the basis of such systems.

## ANNEX

### BASIC TECHNOLOGICAL RESEARCH AND THE APPLICATION OF NEW TECHNOLOGIES (BRITE) PROGRAMME (1985 to 1988)

The objectives of the programme are as follows:

#### I. Precompetitive basic technological R&D in:

##### 1. Reliability, wear and deterioration

Including in particular:

- (a) methods for initial service life and residual life prediction and the assessment of defects in materials, components and assemblies;
- (b) the tribological, wear and erosion properties of materials, components and assemblies in adverse conditions, including those resulting from particularly high stresses;
- (c) fracture mechanics, including unstable fracture, fatigue, creep and corrosion effects, with a view to improving the mechanical behaviour and the predictable life of materials, components and assemblies;
- (d) mechanisms of corrosion and corrosion protection in aggressive environmental conditions including biological action;
- (e) surface treatment and protective coating technology to modify the physical and mechanical properties of materials, components and assemblies, including scaling-up of processes already available on a laboratory scale, surface properties and phenomena at interfaces.

##### 2. Laser technology and its application and other new methods of metal shaping and forming

Including in particular:

- (a) high-power lasers for materials processing, including the interaction of laser beams with materials and safety and work procedures involved in the industrial use of lasers;
- (b) near-net-shape manufacturing technology, in particular powder metallurgy.

##### 3. Joining techniques

Including in particular:

- (a) new and improved welding techniques, including electron beam, diffusion and friction welding and low-cost automated welding, including sensors and adaptive control systems;

(b) new or improved adhesive, soldering and brazing techniques and their adaptation for use in mass production. Joining of new and dissimilar materials.

4. New testing methods including non-destructive testing, on-line testing and computer-aided testing

Including in particular:

(a) testing techniques for the measurement, detection and presentation of defects, stresses and deterioration processes, including corrosion, wear, fracture and crack-initiating processes, and biologically induced damage, methods for use under service stresses and their simulation;

(b) computer applications to testing techniques and systems, particularly with a view to use in manufacturing processes.

5. CAD/CAM and mathematical models

Including in particular:

(a) CAD/CAM techniques for industrial processes exploiting work on architectures and algorithms carried out elsewhere including ESPRIT and related to specific processes and including low-cost techniques suitable for small and medium-sized enterprises (SMEs);

(b) mathematical modelling of production processes and phenomena including modelling related to flexible manufacturing systems suitable for SMEs.

6. New materials, in particular polymers, composites and other new materials with special properties.

Including in particular:

(a) polymers and composites with special and improved physical and mechanical properties and stability for wider use in engineering, medical and agricultural applications;

(b) new production and conversion techniques for polymers and composites;

(c) new materials with special electrical, magnetic and opto-electronic properties.

7. Membrane science and technology and problems in electrochemistry

Including in particular:

(a) separation by membrane processes of both gaseous and liquid mixtures reverse osmosis, ultrafiltration, microfiltration, dialysis and pervaporation;

(b) new membrane materials including ceramic materials;

(c) electrolysis technology, in particular fused salt electrolysis, irreversible phenomena of anodic systems and the use of membrane technology in electrolysis systems.

## 8. Catalysis and particle technology

Including in particular:

(a) zeolites as catalysts in organic chemicals synthesis, including their production, characterization and shaping and application in shape-selective catalysis;

(b) homogeneous catalysis, in particular for oxidation reactions of potential industrial interest;

(c) catalytic purification of industrial effluents, including SO<sub>2</sub> and NO<sub>x</sub> disposal;

(d) particle technology, in particular problems related to the manufacture of particles, particle contamination and equipment design.

II. Precompetitive technological R&D, including pilot and demonstration projects, in new production technologies suitable for products made from flexible materials:

The following are the three main research areas included in the programme:

--The automated handling of flexible materials and articles made from them. This may include research into:

(a) the automated feeding and evacuation of automatic sewing machines, from various delivery systems, with one or more pieces of fabric or subassemblies by robotic devices, in two or three dimensions, with the aid of sensors, grippers, etc.

(b) the automated transport of fabric pieces, subassemblies and finished articles from one work station to another, including adaptive control of the production plan. Transport may be done by mechanical systems or by remote controlled or programmable trolleys;

(c) the development of sequential automated sewing units.

--Automated joining of flexible materials and their assembly into finished products. This may include research into:

(a) the extension of existing automatic sewing technologies, with particular reference to three-dimensional sewing and the multiple operation of machines by one operator;

(b) movable sewing heads either on conventional type machines or as a flexible lightweight sewing head;

(c) new stitch technology, with particular reference to the possibility of sewing from one side of the work piece only;

(d) alternative joining techniques to sewing;

(e) technologies to increase the flexibility of automatic sewing machines, for example by interchangeable tools;

(f) microelectronic control techniques (and software) might be required for extending automated sewing techniques, especially in three dimensions.

--The integration of the above technologies together with others leading to flexible sequential automated manufacture, with particular emphasis on the need to accommodate multiproduct manufacture and frequent model changes. This may include research into:

(a) elements necessary to construct a fully automated system other than those already covered above. Some of these could involve quality control, fabric control, cutting and finishing operations. More than one possible eventual solution can be envisaged and it is important not only that the work carried out fits into one or other of the possible solutions, but that each possible solution is effectively researched;

(b) the automatic creation of models in three dimensions and the resulting two-dimensional pattern, including modifications to the model;

(c) the development of knitting technology as an alternative to the cutting and sewing of fabric;

(d) the automatic marking and identification of individual parts, and the interpretation of the operations to be carried out on them.

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END